

# Primary Burkitt Lymphoma of the Ovary

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## Summary

A 20-year-old woman presented with features of a twisted ovarian cyst and had an emergency laparotomy. Intraoperative findings revealed bilateral solid ovarian tumors and a left oophorectomy with biopsy of the contralateral ovary performed. Histopathology report confirmed Burkitt lymphoma of ovary. There was no other evidence of lymphoma elsewhere. The primary Burkitt lymphoma of the ovaries was successfully managed with six courses of highly toxic chemotherapy (Berlin-Frankfurt-Munster 1986 protocol). The patient has remained disease free for the last 36 months.

**Key Words:** Primary ovarian lymphoma, Burkitt lymphoma, Outcome

## Introduction

Involvement of the ovary by malignant lymphoma is well known as a late manifestation of disseminated disease. Primary ovarian lymphoma is unusual, accounting for 0.5% of all non-Hodgkin's lymphoma. Diffuse large B-cell (Revised European American Lymphoma, REAL classification) is the commonest histology subtype and this made primary Burkitt lymphoma of the ovary extremely rare. Most case-reports of Burkitt lymphoma affecting the ovary describe advanced stage disease with secondary metastases to the ovaries. Prognoses of these cases were generally poor. We present a case of primary Burkitt lymphoma of the ovaries, successfully treated with chemotherapy following laparotomy for suspected torsion of ovary.

## Case Report

A 20-year-old nulliparous woman was admitted with acute lower abdominal pain. Examination revealed a tender lower abdominal mass and pelvic ultrasonography showed a complex adnexal mass. She had emergency laparotomy done for a presumed

diagnosis of twisted ovarian cyst. Intra-operative findings revealed bilateral solid ovarian tumors, measuring 5cm on the right side and 8cm on the left. The tumor surface was vascular but no adhesion noted. Hemoperitoneum was minimum. There was hemorrhage from the extremely friable left ovary and required oophorectomy to secure hemostasis. Biopsy was also taken from the right ovary. There was no other intraperitoneal organ involved. The disease was in Stage 1B (FIGO). Her postoperative recovery was uneventful. The histopathology report confirmed Burkitt lymphoma of the ovary with appearance of non-cleaved small cells and typical features of 'starry-sky' on microscopic evaluation. The immunohistophenotype studies were positive for LCA (CD45) and B cell markers (CD20 and CD 79) but stained negative against cytokeratin and other T-cell markers. She was jointly managed with the hematology team. Extensive investigations for abnormal cells including full blood examination, diagnostic lumbar puncture and bone marrow trephine biopsy were negative for systemic lymphoma. Her HIV status and Epstein-Barr viral (EBV) antibodies were also negative. Computerized tomography (CT) scan of the chest, abdomen and pelvis were normal but serum lactate

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dehydrogenase (LDH) was elevated (2632 u/l; normal 211-423). The malignancy was defined as primary non-Hodgkin's lymphoma of ovary- Burkitt type, Ann Arbor Stage IE. Chemotherapy was commenced promptly two weeks post laparotomy. She was treated with the Berlin-Frankfurt-Munster (BFM) regime, which included cyclophosphamide and prednisolone followed by alternating courses of dexamethasone/ ifosfamide/ methotrexate/ vincristine/ cytarabine/ etoposide and dexamethasone/ cyclophosphamide/ methotrexate/ vincristine/ doxorubicin with prophylactic intrathecal methotrexate. Despite toxicity associated with this chemotherapeutic regimen, the patient completed the treatment. She responded to the chemotherapy with no residual disease as demonstrated on a repeat CT scan. The serum LDH level normalized, six months post- chemotherapy and she has been free of the disease for the last 36 months.

### Discussion

Burkitt lymphoma is usually diagnosed incidentally at laparotomy or more often, presents as cyst accidents as in this patient. All diagnosis of Burkitt lymphoma is made postoperatively. Due to its rarity, other more common solid tumors such as dygerminoma, granulosa cell tumor or fibroma, are usually considered first. The tumour tends to twist due to its high proliferation rate. It is also friable and bleeds easily as seen in this patient. Burkitt lymphoma was confirmed by the characteristic histopathology findings supported by immunohistochemistry results. However, screening for chromosomal translocation, involving the c-myc gene,

was not done in this case. Controversies regarding the existence of primary ovarian lymphoma were resolved when Monterosso *et al* demonstrated the presence of lymphoid tissue in the normal ovaries although scarce. This further explains the rarity of the disease. This patient fulfilled all the stringent criteria proposed by Fox and Langley<sup>2</sup> for diagnosis of primary ovarian lymphoma. To date, only 20 cases have been reported using these criteria<sup>3</sup>.

Staging of Burkitt lymphoma using the Ann- Arbor Staging (AAS) is associated with some limitations. It was originally designed for staging Hodgkin's Lymphoma, which spread by lymphatic route compared to the hematogenous dissemination of non-Hodgkin's lymphoma. Extranodal organ involvement is also more common in NHL, which maybe mistaken for a more advanced stage under the AAS staging system. The tumour bulk in Burkitt lymphoma, correlates best with prognosis but is not addressed by the AAS staging. The issue of whether bilateral ovarian involvements, which is common in Burkitt lymphoma, denote a more advanced stage remains unresolved. However, bilateral involvement of the orbit and breast has not been associated with poorer prognosis. A useful tool to prognosticate the disease is the International Prognostic Index (IPI)<sup>4</sup>. It consists of five risk point criteria, namely age, presence of two or more extranodal sites, performance status, serum lactate dehydrogenase (LDH) level and stage of disease. This patient is young, and has limited disease. She scored two of five (low intermediate risk) in the IPI, which predicts a favorable outcome.



Fig. 1: The fleshy tumour mass with bosselated external surface

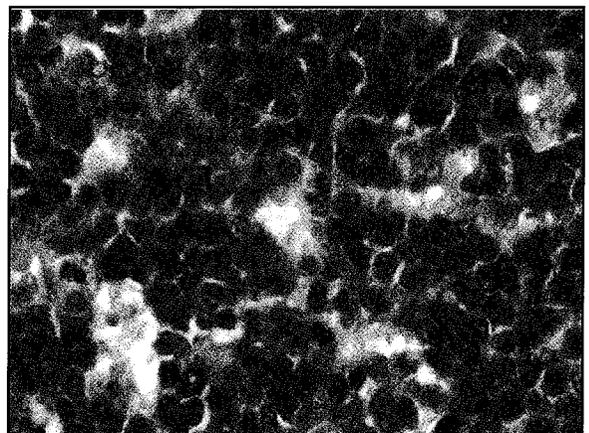


Fig. 2: The 'starry-sky' appearance - isolated histiocytes on the background of abnormal lymphoblasts

Surgery is not the primary treatment option. Most ovarian lymphomas were removed incidentally during surgery for suspected ovarian tumor. Despite the malignant appearance of this tumour, pelvic clearance was deferred at the time of surgery as the diagnosis was not confirmed. Furthermore, she is young and aggressive surgical resection may induce surgical menopause and sterility. The mainstay of treatment is chemotherapy and further surgery is not necessary. The chemotherapy used is usually multiple, intense and rapid cycle to match the high growth rate of this tumour. There are many different regimes available but this patient was given the Berlin- Munster- Frankfurt (BFM) regime, which included intrathecal methotrexate. This highly toxic regime was adapted from the treatment protocol of childhood B cell- acute lymphoblastic leukemia (B-ALL). The results of this

intensive chemotherapy regime in both children and adults have been favorable. The event-free survival rate approaches 90%, while the five-year survival rate was 81%. About 10% of these patients succumbed during chemotherapy due to complications such as tumour lysis syndrome and chemotoxicity. The hyperuricemic state in tumour lysis syndrome is associated with excessive tumour load and requires uricolytic drugs such as allopurinol and urate- oxidase to preserve the renal function. There is currently no role for radiotherapy.

Primary Burkitt lymphoma of the ovary is rare and mimics other common gynecologic tumours. Therefore, gynecologists need to be aware of the favorable outcome following aggressive chemotherapy without mutilating surgery.

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